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Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 10863 (1984): One Day Alarm Clocks [PGD 23: Horology]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

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“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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Indian Standard

SPECIFICATION FOR ONE DAY ALARM CLOCKS

1. Scope

1.1 Covers the requirements and methods of test for general purpose one day alarm clocks of the shelf and table types, hand wound and spring driven.

1.2 The requirements of digital clocks are not included.

2. Sizes

2.1 The sizes of alarm clocks shall be as follows:

- a) 80 to 110 mm dial opening diameter in steps of 5 mm, and
- b) Any special shape as required by the purchaser.

3. General Requirements

3.1 The design and construction of the clock shall comply with the requirements specified in 3.1.1 to 3.10.

3.1.1 The clock shall indicate the hour, minute and second (if second is provided in the design of the clock), and calender (if provided in the design).

3.2 Case — The case of the clock shall be made of sheet metal or plastic or other suitable materials. The metallic case shall have a durable and corrosion resistant finish. The plastic case shall be of suitable finish depending upon the requirements and should be strong enough to withstand normal strain and stresses of daily use. The case shall be dust proof as far as possible with minimum number of openings. Only those openings necessary for time/clock winding keys, time/alarm setting knobs, alarm interruption button and regulator shall be provided and such openings shall be suitably covered with plastic washers, etc. In case an additional opening is required, this may be covered with a mesh cloth or with suitable plug to prevent dust entering the movement.

3.2.1 All cases shall have a clear transparent crystal made of glass or plastic material. The crystal shall be free from all surface defects, such as inclusions, air bubbles, and cracks, to ensure visibility to time display, the crystal shall be tightly fitted in the clock.

3.2.2 On the outside of the case there shall be markings to indicate the direction of the knobs, keys and regulator by arrows and their designation by words or symbols. For adjusting the rate of movement the following marks or words shall be indicated on the outside of the case:

- a) + and —
- b) F and S

3.3 Dials — The dials shall be of the sizes specified in 2.1. The dial should be made of metal or other suitable material and shall be securely fastened to its base so as to prevent warping, buckling or any other irregularity impairing the appearance. The dial shall incorporate Hindu-Arabic or Roman figures or other markings including the minute marks on a contrasting back ground for the purpose of indicating the time and setting of alarm. The dial and hands may incorporate suitable luminous paint when required by purchasers.

3.3.1 Luminosity shall be such that any person with normal eye sight shall be able to read the time easily in total darkness from a distance of one metre when observation is made as given in 6.4. The deposits of luminous material shall conform to IS : 9275-1979 'Requirements for radioluminescence for timekeeping instruments'.

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3.4 Materials used for the parts should be of good quality, meeting the requirements of relevant Indian Standards wherever published. The finish shall be of good acceptable quality with necessary corrosion resistant properties to meet the acceptance tests as may be agreed to between the manufacturers and purchasers.

3.5 Manual setting for on or off mechanism for the alarm shall be provided in the clock and it shall work satisfactorily.

3.6 The movement shall be fixed to the case in such a way that there is no possibility of it being displaced during winding and use. The fixing of the movement to the case should be such that it is easy to open and refit during service.

3.7 The alarm clock shall have a strong and level base or at least three legs at bottom to keep the alarm clock stable in a vertical position with 12 O'clock at the top.

3.8 The power supply of the time mechanism and alarm mechanism may be by separate springs or from the same spring depending on the design and construction.

3.9 A suitable hanger may be provided at the top of the case.

3.10 The outer casing shall be plated in accordance with IS : 1068-1968 'Electroplated coatings of nickel and chromium on iron and steel'. Alternatively the casing shall be suitably painted for rust protection.

4. Functional Requirements

4.1 The clock shall work satisfactorily in temperature range of $+55^{\circ}\text{C}$ to -10°C and shall meet the requirements of test given in 6.2.

4.2 The clock shall operate for not less than 30 hours on one complete winding of the main spring.

4.3 The indication of the hour and minute hands shall be in relation to each other. At the time of coincidence of hour hand with hour marks 3, 6, 9 or 12 on the dial, the position of minute hand must be within ± 6 minute (or equivalent angle) of the hour mark 12.

4.4 Each clock shall be equipped with a regulator for time regulation. The movement of the regulator lever shall be so adjusted that from the central position to either $+$ or $-$ limit position, it shall cover a minimum of 10 minutes variation on either side over a period of 24 hours.

4.5 The clock shall have a loud and clear alarm and the movement shall be so constructed that the alarm shall sound continuously or intermittently depending upon the design for at least 20 seconds.

4.6 The variation between alarm setting time and actual sounding of the alarm shall not exceed ± 5 minutes.

4.7 The alarm clock shall not visibly vibrate when the alarm operates.

4.8 At the end of 2 000 hours run, the clock shall be subjected to tests for conformity to requirements given in 4.2 to 4.7 and 6.2 (b).

Note — The above test shall be carried out for the purpose of type approval only.

4.8.1 The average gain or loss of time for 24 hours run shall be calculated as given in 6.2(a). The difference in two consecutive readings obtained shall not exceed three minutes.

4.9 Type Test — The probability of the clock giving satisfactory service during a continuous run of 2 000 hours at ambient temperature, shall be 0.95. The clock shall be deemed to give satisfactory service if the conditions given in 4.1 to 4.7 are satisfied.

5. Sampling

5.1 Unless otherwise agreed to between the buyer and the seller, the procedure given in IS : 2500 (Part 1)-1973 'Sampling inspection tables : Part 1 Inspection by attributes and by count of defects (*first revision*)' shall be followed for sampling inspection. The inspection level and sampling plan as given in 5.1.1 to 5.1.3 shall be followed for various tests.

5.1.1 For the characteristics given in 4.2 to 4.8 and 6.2(a), the scale of sampling shall be according to level III given in Table 1 of IS : 2500 (Part 1)-1973. The single sampling plan with AQL 2.5 percent given in Table 2 of IS : 2500 (Part 1)-1973 shall be followed.

5.1.2 For tests given in 6.2(b), the single sampling plan with inspection level I and AQL 2.5 percent given in Tables 1 and 2, respectively of IS : 2500 (Part 1)- 1973 shall be followed.

5.1.3 For the type test given in 4.9, the number of clocks to be tested shall be 5. All the clocks shall meet the relevant specified requirements.

6. Inspection and Tests

6.1 Inspection — Alarm clocks shall be visually examined for the following:

- i) General appearance and external defects, such as any loose, missing, damaged, broken or scratched component;
- ii) Any noticeable defect in the fitting of dial, crystal, etc;
- iii) Marking on the dial for any missing, illegible or incomplete marks, scratches or dents on the dial;
- iv) Hands rubbing against dial or crystal. Obstruction in the movement of hands and for any bent, malformed or damaged hand;
- v) Surface quality of crystal glass and for presence of blisters, bubbles, scratches or any other defects which may impair vision;
- vi) Cracking, chipping, flaking or bubbling of luminous compound deposited on hands and dial.

6.2 Tests — Alarm clocks shall be subjected to tests at ambient temperature and at temperature of +55°C and -10°C as given below:

- a) *Ambient temperature test* — The clock shall be tested with the help of a standard chronometer (or standard quartz clock) during a period of 48 hours at ambient temperature. The clock shall be rewound after it has run for 24 hours without adjusting the time regulator and the difference in time measured after 48 hours divided by 2. This average daily variation in time shall not exceed +2 and -1 minute. The test shall be carried out in vertical position of the clock with its regulator nearer to its central position.
- b) *Test at + 55°C and -10°C* — These tests shall be repeated as in 6.2(a) keeping the clock in vertical position only. The total inaccuracy of time keeping shall not exceed ± 5 minutes without changing the setting of the time regulator.

6.3 The alarm clocks shall be tested for conformity to the requirements covered in 4.2, 4.5 and 4.6. In the case of clocks with intermittent alarm system, the minimum duration of each strike shall be four seconds.

6.4 The luminosity of hands and markings on dial shall be such that any person with normal eye sight shall be able to read the time easily in total darkness from a distance of one metre. The clock shall have been in total darkness for 12 hours prior to reading the time. The observer shall remain in darkness for 15 minutes before making the observation.

6.5 Checks shall be made to ensure that the characteristics of the lubricating oil used in the clock are not adversely affected under the extreme temperature conditions of +55°C and -10°C.

6.6 Alarm clock with its winding spring after having run down shall start functioning again by giving not more than one full rotation to the winding shaft.

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7. Packing — Alarm clock shall be supplied in a suitable card board box together with a guarantee card and a booklet containing instructions for handling the clock and its time adjustment.

8. Marking — Each alarm clock shall be marked with the manufacturer's name and/or trade-mark.

8.1 ISI Certification Marking — Details available with the Indian Standards Institution.

EXPLANATORY NOTE

This standard is one of a series of Indian Standards relating to alarm clocks. In the preparation of this standard, assistance has been derived from GOST 3145 : 1967 Alarm clock mechanical. USSR State Committee for standards.